IN THE CLAIMS:

1. (Currently amended) A device, comprising a housing holding a sensor, said housing having an inner surface, said inner surface having an inner-surface-inside dimension, said sensor including a coil and a captive core, wherein said coil has a coil inside diameter, wherein an electrical measurement of said coil provides information about at least one from the group including displacement of said captive core and velocity of said captive core, further wherein said coil has an axis extending in a first direction, wherein said housing has a minimum outside dimension that is less than 3.00 mm when measured perpendicular to said first direction, wherein said housing further comprises a support for said captive core, wherein said housing inner-surface-inside dimension is greater than said coil inside diameter, wherein said support includes a first bearing and a second bearing, wherein said captive core has a stroke length, wherein said captive core has a first length of contact with said first bearing, wherein said captive core has a second length of contact with said second bearing, wherein said first length of contact is less than said stroke length and wherein said second length of contact is less than said stroke length ~~resistance to lateral force provided by said support is independent of displacement of said core~~.

2. (Original) A device as recited in claim 1, wherein said housing has a minimum outside dimension that is less than 2.50 mm when measured perpendicular to said first direction.

3. (Original) A device as recited in claim 1, wherein said housing has a minimum outside dimension that is less than 2.00 mm when measured perpendicular to said first direction.

4. (Original) A device as recited in claim 1, wherein said housing has a minimum outside dimension that is less than 1.80 mm when measured perpendicular to said first direction.

5. (Original) A device as recited in claim 1, wherein said housing has a minimum outside dimension that is less than 1.60 mm when measured perpendicular to said first direction.

6. (Original) A device as recited in claim 1, wherein said housing has a minimum outside dimension that is less than 1.40 mm when measured perpendicular to said first direction.

7. (Original) A device as recited in claim 1, wherein said captive core extends into said coil.

8. (Currently amended) A device as recited in claim 1, wherein said captive core has a first portion having a first diameter, wherein said captive core further includes a second portion having a diameter greater than said first diameter for retaining said core within said housing~~, and wherein said captive core is supported in said housing by a first bearing and by a second bearing~~.

9. (Original) A device as recited in claim 8, wherein said first bearing is connected to said housing, wherein said core slides within a hole in said first bearing.

10. (Previously presented) A device as recited in claim 8, wherein said second bearing is mechanically mounted to at least one from the group including said coil and said housing, wherein said core slides within a first hole in said first bearing and wherein said core slides within a second hole in said second bearing.

11. (Original) A device as recited in claim 8, wherein said second bearing is integral with said second portion and mechanically connected to said core, wherein said second bearing moves with said core.

12. (Original) A device as recited in claim 11, wherein said first bearing and said second bearing are jewel bearings.

13. (Original) A device as recited in claim 11, wherein said captive core comprises steel, stainless steel, titanium, aluminum, plastic, or a super-elastic material.

14. (Original) An sensor as recited in claim 13, wherein said superelastic material comprises nitinol.

15. (Original) A device as recited in claim 1, wherein said displacement or velocity sensor comprises an inductive sensor or an eddy current sensor.

16. (Original) A device as recited in claim 15, wherein said inductive sensor or said eddy current sensor is a one-coil device.

17. (Original) A device as recited in claim 15, wherein said inductive sensor or said eddy current sensor is a two-coil device.

18. (Original) A device as recited in claim 15, wherein said inductive sensor or said eddy current sensor is a three-coil device.

19. (Original) A device as recited in claim 1, wherein said sensor further comprises a spring to provide a return force to said core.

20. (Original) A device as recited in claim 19, wherein said core extends through said spring and into said coil.

21. (Original) A device as recited in claim 1, wherein said core includes a ferromagnetic material.

22. (Original) A device as recited in claim 21, wherein said ferromagnetic portion comprises iron, nickel, ferrite, or steel.

23. (Original) A device as recited in claim 1, wherein said core further comprises a contact point for making contact with an object to be measured, wherein said contact point is made of a hard material that resists wear.

24. (Original) A device as recited in claim 23, wherein said hard material comprises alumina, ruby, sapphire or hardened steel.

25. (Previously presented) A device as recited in claim 19, wherein said core further comprises a core stop to capture said core within said housing, wherein said core stop further limits extension of said spring.

26. (Previously presented) A device as recited in claim 25, wherein said housing has in inside diameter, and wherein said core stop is sized to have an outside diameter approximately equal to said inside diameter to provide a bearing function for guiding said core.

27. (Original) A device as recited in claim 1, further comprising lead wires electrically connected to said coil and extending to a circuit.

28. (Currently amended) A device for providing displacement information, comprising a housing[[,]] having an inner surface ~~within said housing~~, said inner surface having an inner-surface-inside dimension, said housing ~~for~~ holding a displacement sensor and a guidance mechanism, said displacement sensor including a coil and a captive core, said coil having a coil inside diameter, said captive core having a core-outside dimension, wherein said guidance mechanism comprises a first bearing and a second bearing for guiding said core, wherein said first bearing is connected to said housing, wherein said first bearing has an axial hole having an axial-hole dimension about equal to said core-outside dimension, wherein said core slidably extends through said axial hole, wherein said second bearing has a second-bearing-outside dimension about equal to said inner-surface-inside dimension, wherein said guidance mechanism is for resisting lateral movement of said core while allowing axial movement of said core into and out of said coil, wherein said inner-surface-inside dimension is greater than said coil inside diameter ~~of said coil~~, wherein said captive core has a stroke length, wherein said captive core has a first length of contact with said first bearing, wherein said captive core has a second length of contact with said second bearing, wherein said first length of contact is less than said stroke length and wherein said second length of contact is less than said stroke length.

29. (Original) A device as recited in claim 28, wherein said second bearing is connected to said captive core.

30. (Currently amended) A device as recited in claim 28, wherein said second bearing is connected to said housing ~~or connected to said coil~~.

31. (Previously presented) A device as recited in claim 28, wherein said second bearing is connected to said coil.

32. Cancel.

33. (Original) A device as recited in claim 28, wherein said coil has an axis extending in a first direction, wherein said housing has a housing outside dimension, wherein said housing has a minimum outside dimension that is less than 3.00 mm when measured perpendicular to said first direction.

34. (Original) A device as recited in claim 28, further comprising a spring for spring loading said core.

35. (Original) A system for providing displacement or velocity information, comprising an array of displacement sensors capable of providing displacement or velocity measurements, wherein said displacement or velocity measurements are on center to center spacing of less than 3mm.

36. (Previously presented) A device as recited in claim 10, wherein said core extends out from said housing from said first bearing, wherein said second bearing is spaced a distance from said first bearing to provide said resistance to lateral forces on said core where said core extends from said housing while allowing free axial movement of said core.